**REMARKS:**

AMENDMENTS TO THE CLAIMS

Claims **12-35** were examined. The Examiner has objected to claim **27** because the phrase "polymer material" has insufficient antecedent basis. In this response, Applicant has amended claims **12**, **27**, and **29** to correct for informalities found in the claims. The Applicant submits that these amendments merely make explicit that which was implicit in the claims as originally filed. As such, no new matter has been entered. Furthermore, the Applicant submits that the amendments are being done to improve readability and do not represent a narrowing of any feature of the claims.

CLAIM REJECTIONS

CLAIM 12 IS ALLOWABLE OVER SINGH ET AL.

Claims **12-14**, **20-21**, **23-25**, **27-30**, and **34-35** were rejected under 35 USC 102(b) as being anticipated by U.S. Patent 6,057,035 to Singh et al. (hereinafter Singh). In rejecting the claims, the Examiner states that Singh teaches an inorganic/organic nanolaminate film which is a barrier film having a plurality of layers of an inorganic material and a plurality of layers each consisting of an organic polymer, wherein the layers of organic polymer alternate with layers of inorganic material, wherein adjacent layers are covalently bonded layers. The Applicant respectfully traverses the rejection.

Claim **12** is allowable over Singh as claim **12** recites that adjacent layers of the organic polymer and inorganic material are covalently bonded layers characterized by covalent bonds that couple adjacent layers together. Singh is devoid of any teaching or suggestion of layers of inorganic material covalently bonded to organic polymer layers as set forth in claim **12**. Instead, Singh merely teaches that a surfactant or compatibility agent is covalently bonded to the layered silicates (Col. 6 lines 25-31, Figure 1C, and Col. 2, lines 47-51). Singh does not teach that there is a covalent bond between a layer of silicate and a layer of polymer matrix (which is different from the surfactant). Singh does not show covalent bonds between layers but merely shows covalent bonds between elements in the same layer as discussed in more detail below. Thus, Singh fails to show all elements recited by independent claim **12**.

Applicant has reviewed the Examiner's arguments and respectfully responds as follows. On page 3 of the current Office Action, the Examiner states that the surfactant that bonds the layers is bonded to the inorganic material through an Si—C bond. As support, the Examiner has cited Col. 3, lines 18-23 which states that "direct bonding of the organic surfactant group to the structural Si atom through an Si—C bond provides a "built-in" surfactant...." (emphasis added). However, closer examination of that same paragraph (Col. 3, lines15-18) shows that this Si—C bond only exists in one specific embodiment of the Singh reference as shown in Figure 1C (which is the organically modified layered aluminosilicate (ORMLAS) embodiment, where the silicate and surfactant are a single chemical compound, Col. 2, lines 47-51). The other embodiments in Singh such as that shown in Figure 1B do not have Si—C bonds and are thus only stable at temperatures below 200°C.

Singh's ORMLAS embodiment of Figure 1C is not relevant to the present invention of claim **12** because the embodiment of Figure 1C combines: 1) the surfactant and silicate in one layer and 2) the polymer matrix in another layer. Accordingly, the Si—C bond cited by the Examiner is a bond between elements in the same layer, not bonds between adjacent layers. Singh clearly touts the advantages of having a built-in surfactant (col. 3, lines 20-23). It does not show a covalent bond between adjacent layers or a covalent bond with an element outside the ORMLAS layer. Claim 12 clearly recites that adjacent layers of the organic polymer and the inorganic material are covalently bonded layers characterized by covalent bonds that couple adjacent layers together.

Furthermore, entirely absent from Singh is any discussion of a covalent bond between the layer of surfactant/silicate and the polymer matrix. Singh does not teach that the surfactant is covalently bonded to the polymer. Singh also does not teach that the silicate is covalently bonded to the polymer. In fact, if it is like traditional surfactant/silicate nanolaminates, the bonds to the polymer matrix, if any, are non-covalent bonds.

In fact, Singh teaches away from covalently bonding between the polymer matrix and the silicate by using direct polymer melt intercalation to introduce the polymer (col. 3, lines15-16 and col. 4, lines 38-47). By definition, intercalation suggests mere interleaving of elements and does not teach that any covalent bonding is occurring. In Figure 3 of Singh, single polymer chains 35 appear to float between silicate layers in an interleaved manner. There is no teaching that those polymer chains are actually covalently bonded to the silicate or the surfactant.

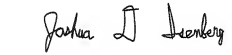
Additionally, Singh also discusses dispersion of inorganic layers in the polymer matrix (Col. 6, lines 66-67) and that delamination of the silicate layers may occur by sonication. The use of the term "dispersion" suggests that covalent bonds are not present between the silicates and the polymer matrix.

Therefore, the Applicant submits that Singh does not show or suggest all the features of claim **12** and a prima facie case of anticipation is not present. Furthermore, it is submitted that Singh does not anticipate claims **13-35** by virtue of their dependence from claim **12**. Accordingly, claim **12** and its dependent claims are allowable over the cited references and define an invention suitable for patent protection.

## CONCLUSION

For the reasons set forth above, the Applicant submits that all claims are allowable over the cited art and define an invention suitable for patent protection. The Applicant therefore respectfully requests that the Examiner enter the amendment, reconsider the application, and issue a Notice of Allowance in the next Office Action.

Respectfully submitted,



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